



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**VALUE ADDED COURSE
ON
Robotics and Animation**

B.Tech: II & III

Semester: I

Academic Year: 2021-22

Course Objectives

1. To understand the fundamentals of robotics, including robot components, sensors, actuators, microcontrollers, and control systems.
2. To develop practical skills in robot design, programming, wireless communication, and IoT-based robotic applications.
3. To learn the principles and techniques of 2D and 3D animation, including character design, modeling, rigging, and rendering.
4. To gain hands-on experience with animation software tools and robotics project development.
5. To integrate robotics and animation concepts to design innovative projects and explore real-world applications.

SYLLABUS

Unit – I: Fundamentals of Robotics

Introduction to Robotics and Animation, History and Applications of Robotics, Components of a Robot, Types of Robots, Basics of Electronics for Robotics, Sensors and Actuators, Introduction to Microcontrollers, and Programming Fundamentals for Robotics.

Unit – II: Robot Design and Control

Robot Movement and Control, Line Following Robot Concepts, Obstacle Avoidance Robot Concepts, Wireless Communication in Robotics, Internet of Things (IoT) in Robotics, Robot Design and Prototyping, and Mini Robotics Project.

Unit – III: Fundamentals of Animation

Introduction to Animation, Principles of Animation, Storyboarding and Character Design, 2D Animation Basics, Animation Software Tools, Frame-by-Frame Animation, Keyframes and Tweening, and Motion Graphics Fundamentals.

Unit – IV: Advanced Animation Techniques

3D Animation Basics, Modeling and Texturing, Lighting and Camera Techniques, Character Rigging, Character Animation, Rendering and Post-Production, and Animation Workflow Management.

Unit – V: Integrated Robotics and Animation Applications

Robotics and Animation Integrated Project, Interactive Animation Systems, Robotics Visualization Techniques, Simulation and Virtual Prototyping, Emerging Trends in Robotics and Animation, and Project Presentation & Review.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**VALUE-ADDED COURSE
ON
Pedagogical Studies**

B.Tech: II

Semester: II

Academic Year: 2021-22

Course Objectives

1. To understand the philosophical, psychological, and developmental foundations of education and learning.
2. To develop effective teaching skills through the application of diverse instructional strategies and classroom management techniques.
3. To utilize educational technology, assessment methods, and feedback mechanisms to enhance student learning outcomes.
4. To promote inclusive education practices, professional ethics, and effective communication in teaching.
5. To design curricula, conduct educational research, and adapt to contemporary trends and innovations in education.

SYLLABUS

Unit – I: Foundations of Education and Learning

Introduction to Pedagogy, Philosophy of Education, Educational Psychology, Child Growth and Development, Learning Theories, Cognitive Development in Learners, Motivation and Learning, and Individual Differences Among Learners.

Unit – II: Teaching and Learning Strategies

Classroom Management, Teaching-Learning Process, Teaching Methods and Strategies, Student-Centered Learning, Cooperative Learning, Inquiry-Based Learning, Project-Based Learning, Lesson Planning, and Instructional Objectives.

Unit – III: Educational Technology and Assessment

Teaching Aids and Educational Technology, Digital Learning and E-Learning, Assessment and Evaluation, Formative Assessment Techniques, Summative Assessment Techniques, and Feedback and Reflective Teaching.

Unit – IV: Inclusive and Professional Education Practices

Inclusive Education, Special Education Needs, Communication Skills for Teachers, Professional Ethics in Teaching, and Action Research in Education.

Unit – V: Curriculum and Contemporary Educational Trends

Curriculum Design and Development, Contemporary Trends in Education and Teaching Practices, Innovative Teaching Approaches, Educational Policy and Reforms, Technology-Enhanced Learning Environments, and Project Presentation & Review.



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**VALUE-ADDED COURSE
ON
Block chain Technology**

B.Tech: III

Semester: II

Academic Year: 2021-22

Course Objectives

1. To understand the fundamental concepts, architecture, and decentralized nature of blockchain technology.
2. To learn the cryptographic principles, transaction mechanisms, and network structure of Bitcoin.
3. To explore blockchain development concepts, Bitcoin programming, and practical blockchain applications.
4. To understand Ethereum, smart contracts, Ricardian contracts, and enterprise blockchain frameworks such as Hyperledger.
5. To analyze real-world blockchain use cases, implementation challenges, and emerging trends in blockchain technology.

SYLLABUS

Unit – I: Fundamentals of Blockchain Technology

Introduction to Blockchain Technology, The History of Blockchain, CAP Theorem and Blockchain, Benefits and Limitations of Blockchain, Decentralization Using Blockchain, Methods of Decentralization, Routes to Decentralization, Cryptography in Blockchain, Cryptographic Primitives, Asymmetric Cryptography, and Public and Private Keys.

Unit – II: Bitcoin and Blockchain Architecture

Bitcoin Improvement Proposals (BIPs), Bitcoin, Transactions, Transaction Types, The Structure of a Block, The Genesis Block, The Bitcoin Network, Wallets and Its Types, and Bitcoin Payments.

Unit – III: Bitcoin Ecosystem and Development

Bitcoin Investment and Buying and Selling Bitcoins, Bitcoin Installation, Bitcoin Programming and the Command Line, Blockchain Security Concepts, Consensus Mechanisms, and Practical Applications of Bitcoin.

Unit – IV: Ethereum and Smart Contracts

Ethereum Blockchain, Elements of the Ethereum Blockchain, Precompiled Contracts, Smart Contract and Hyperledger, History of Smart Contracts, and Ricardian Contracts.

Unit – V: Hyperledger and Enterprise Blockchain

Hyperledger Projects, Enterprise Blockchain Solutions, Blockchain Use Cases Across Industries, Blockchain Implementation Challenges, Future Trends in Blockchain Technology, and Project Presentation & Review.